

NEW WORLD SPECIES OF *HOLCOPELTE* AND *IONYMPHA*
(HYMENOPTERA: EULOPHIDAE), WITH DESCRIPTIONS OF
TWO NEW SPECIES

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Abstract.—The genera *Holcopelte* Förster and *Ionympha* Graham (Hymenoptera: Eulophidae) are for the first time recorded from the Americas. The American *Holcopelte* comprises two new species: *H. americana* from Canada and the United States, and *H. huggerti* from the United States, Ecuador and Peru. Females and males are described for both species. *Ionympha* is represented by two species in the Americas: *I. carne* (Walker) from Canada, Ecuador and Peru, and *I. ochus* (Walker) from Canada. The hosts are unknown for all four species.

Key Words: Eulophidae, *Holcopelte*, *Ionympha*, New World, taxonomy

Förster (1856) described *Holcopelte* to include *Elachistus obscurus* (Förster, 1841). Later, he described *H. fulvipes* (1861), which was later synonymized with *H. obscura* by Bouček & Askew (1968). Thomson (1878) included *Holcopelte* as a species-group in the genus *Derostenus*; he also described *D. sulciscuta* which was later transferred to *Holcopelte* (Graham, 1959). Ashmead (1894) described six species of *Holcopelte* from the Island of St. Vincent. Later (1904), he synonymized *Holcopelte* with *Horismenus* Walker. Erdős (1958) described *Horismenus lenticeps* from Hungary, which was later transferred to *Holcopelte* (Bouček & Askew, 1968). Graham (1959) resurrected *Holcopelte* and presented a key to the two British species. Bouček (1969) described *Holcopelte stelteri* from Germany and gave a key to the four European species.

The six species described from St. Vincent by Ashmead were *Horismenus*, and prior to this paper no records of *Holcopelte* from the Americas have been published. Since only the females are known in the

European species, this is the first time male *Holcopelte* are described. Hosts are only known for two of the European species (*obscura*, *stelteri*), both have been reared from gallmidges (Diptera, Cecidomyiidae) (Bouček & Askew 1968, Bouček 1969).

Ionympha was described by Graham (1959) to include *Entedon carne* and *E. ochus*; both species were originally described by Walker (1839). No additional species have been described. The genus was only known from Europe. Hosts are unknown for both species.

Abbreviations used in the text are: HE = height of an eye; MO = width of mouth opening; MS = malar space; OOL = distance between one posterior ocellus and eye; POL = distance between posterior ocelli; POO = distance between posterior ocelli and occipital margin; WH = width of head (dorsal view); WT = width of thorax across shoulders. Abbreviations of museums and private collections are as follows: BMNH = British Museum (Natural History), London, England; CH = collection of the author;

CNC = Canadian National Collections, Ottawa, Canada; LUZM = Lund University Zoological Museum, Lund, Sweden; USNM = National Museum of Natural History, Washington, D.C., USA.

Genus *Holcopelte* Förster

Holcopelte Förster, 1856: 78. Type-species: *Elachistus obscurus* Förster, 1841: 40, by original designation.

Diagnosis.—Head lenticular; face, frons and occiput smooth and polished; interantennal elevation high and clearly delimited (Figs. 3, 5, 7, 9); mandibles four-dentate (Fig. 7); antenna with two small, discoid anelli; notaular depressions distinct, long and narrow (Fig. 1); thorax with a median furrow extending from posterior mesoscutum to anterior scutellum (Fig. 1); postmarginal vein shorter than stigmal vein; male four basal flagellar segments with a single whorl of long hairs at the base of each segment, fifth segment with a basal whorl and with scattered hairs in front of whorl (Figs. 4, 8).

Remarks.—The monophyly of *Holcopelte* is shown through the following synapomorphies: 1) face, frons and occiput smooth and polished; 2) notaular depressions distinct, long and narrow, and clearly delimited from remaining mesoscutum; 3) thorax with a median furrow extending from posterior mesoscutum to anterior scutellum.

The American species differ from European species by having a pale petiole and female forecoxa brown (European species with petiole dark and all coxae with same color in female).

KEY TO THE NEW WORLD SPECIES OF *HOLCOPELTE*

1. Females
- Males
2. Antennal scrobes joining before reaching vertical line of frontal fork (Fig. 3); scape 5.0× as long as wide with 6–7 setae along ventral edge (Fig. 2); reticulation on median thoracic dorsum engraved (slightly raised on the sides and

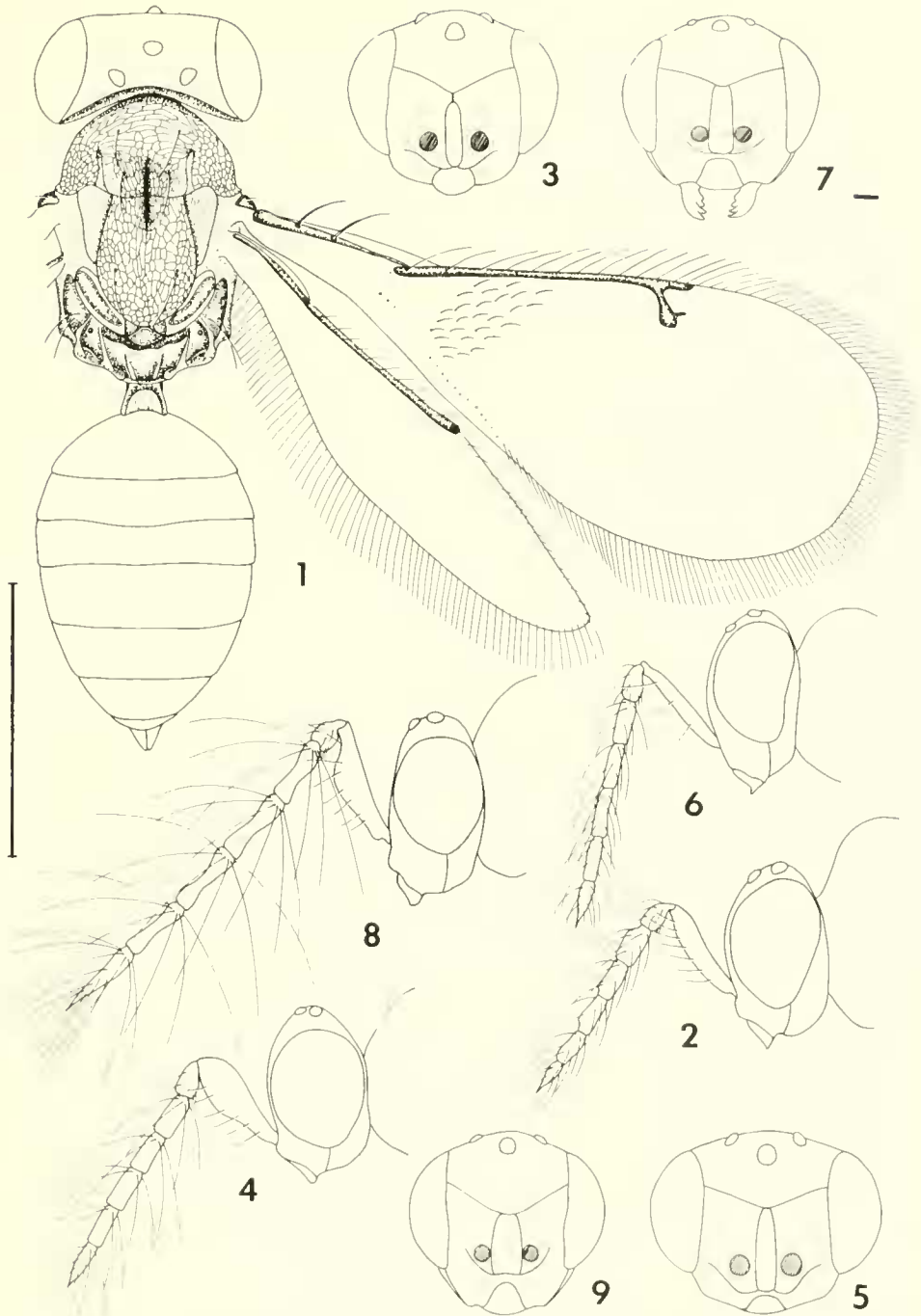
along hind part of scutellum); cubital hair-line of forewing almost straight (Fig. 1); propodeum sculptured and with 4 plicae (Fig. 1); petiole conical without a dorsal shield

- *H. americana* new species
- Antennal scrobes never meet (Fig. 7); scape 8.0× as long as wide with 3–5 setae along ventral edge (Fig. 6); thoracic dorsum with raised reticulation; cubital hair-line of forewing strongly sinuate below speculum (Fig. 12); propodeum smooth to almost smooth with 2 plicae (Fig. 11); petiole quadrangular (shape transverse to slightly elongate) with a dorsal shield that covers petiolar foramen (Figs. 10, 11) *H. huggerti* new species
- 3. Petiole small and conical, without a dorsal shield (like Fig. 1); cubital hair-line of forewing almost straight (like Fig. 1); scape apically expanded (Fig. 4); flagellum infusate, segments 2.0–2.5× as long as wide *H. americana* new species
- Petiole distinctly elongate (1.5–3.0× as long as wide) with a dorsal shield (like Figs. 10, 11); cubital hair-line of forewing strongly sinuate below speculum (like Fig. 12); scape distinctly narrowing at apex (Fig. 8); flagellum pale, segments 3.5× (apical segment 5.0×) as long as wide and slightly narrowed medially *H. huggerti* new species

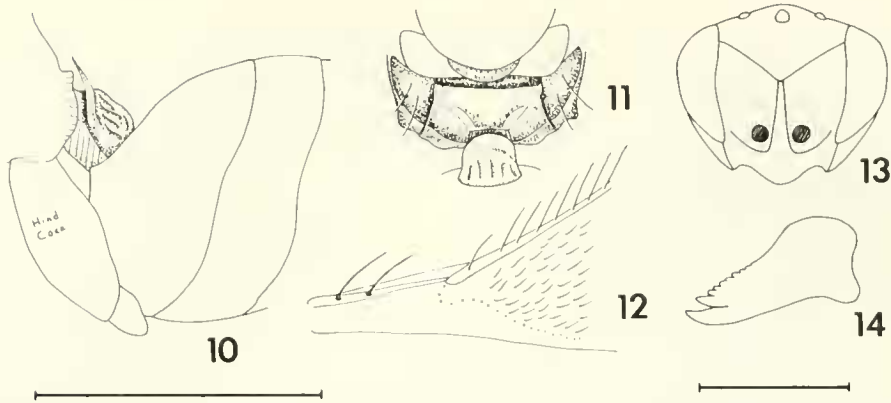
Holcopelte americana, NEW SPECIES Figs. 1–5

Diagnosis.—Petiole small and conical, without a dorsal shield; cubital hair-line of forewing almost straight; reticulation on median thoracic dorsum engraved; propodeum with four plicae; ratio width/length of dorsellum = 2.4/1.0. Female: antennal scrobes joining before reaching vertical line of frontal fork; scape 5.0× as long as wide with 6–7 setae along ventral edge. Male: scape apically expanded; flagellum infusate; flagellar segments 2.0–2.5× as long as wide; head transverse in frontal view.

Description.—*Female*: Scape yellowish-white, more or less infusate in apical part, remaining antenna brown. Face, frons and occiput golden-green, occasionally bluish. Thorax varying from blackish to brownish, usually also with a slight golden-green tinge



Figs. 1-9. *Holcopelte* spp. 1, ♀ *H. americana* new species, habitus. 2, Same, lateral view of head. 3, Same, frontal view of head. 4, ♂ *H. americana*, lateral view of head. 5, Same, frontal view of head. 6, ♀ *H. huggerti* new species, lateral view of head. 7, Same, frontal view of head. 8, ♂ *H. huggerti*, lateral view of head. 9, Same, frontal view of head. Scale representing 0.50 mm.



Figs. 10-14. 10-12, ♀ *Holcopelte huggerti* new species. 10, Side view of petiole. 11, Dorsal view of propodeum and petiole. 12, Base of forewing. 13-14, ♀ *Ionympha carne* (Walker). 13, Frontal view of head. 14, Left mandible. Scale to the left representing 0.25 mm (Fig. 10), and 0.50 mm (Figs. 11-13); scale to the right representing 0.10 mm (Fig. 14).

(lacking in some specimens). Forecoxa brown, mid- and hindcoxae pale (usually whitish, but occasionally yellowish), remaining parts of legs varying from yellowish to predominantly infusate. Wings hyaline or weakly infusate, veins pale. Petiole yellowish-white. Gaster with same color as thorax. Length of body: 0.9-1.3 mm. Flagellum with all five segments free, segment I 1.5-2×, II about 2×, III and IV 2.3-2.5×, and V about 3× as long as wide. Ratios HE/MS/MO = 4.2/1.0/3.0. Malar space 1.5× as wide as width of scape in widest part. Frontal fork V-shaped. Inner orbit of eye with one row of setae. Ratios POL/OOL/POO = 8.4/3.6/1.0. Entire occipital margin with a fine and sharp edge, extending from eye to eye. Ratio WH/WT = 1.3/1.0. Pronotal collar without transverse carina. Anterior part of mesoscutum with reticulation slightly raised above the surface, with transverse meshes. Median and posterior mesoscutum with finer and engraved reticulation, meshes isodiametric or slightly elongate. Notaular depressions clearly delimited from remaining mesoscutum, narrow and extending along posterior half of mesoscutum. Midlobe of mesoscutum with a fine furrow, usually extending along posterior-median half of mesoscutum, but occasionally shorter. Scutellum with fine and engraved reticulation, slightly raised along

sides and hind part. Meshes slightly to very elongate in median part, isodiametric along sides and hind part. Furrow on median mesoscutum continuing on scutellum, extension varying from anterior to entire scutellum. Dorsellum 2.4× as wide as long, with irregular sculpture and usually divided into three concave areas. Forewing rounded, hindwing with apex varying from rounded to sharply pointed. The shape of apex of hindwing is linked to the size of the specimen: small specimens have a pointed apex, while large specimens have a rounded apex. Speculum developed and closed below, cubital hair-line almost straight. Ratios length of marginal/postmarginal/stigmal veins = 7.1/1.0/1.2. Anterior part of propodeum with a relatively wide transverse furrow, extending between stigmata. With two pair of plicae, outer pair separating propodeal callus from propodeum, inner pair situated half way between outer plica and median propodeum (these are occasionally bifurcate in posterior part), with or without a median carina. With a pair of carinae ascending from upper corners of petiolar foramen, reaching half way up on propodeum. Propodeal surface usually with weak reticulation and/or other weak sculpture. Propodeal callus with two setae. Petiolar foramen triangular to rounded in shape. Petiole conical, at most as long as wide, usually

slightly transverse. Gaster ovate and moderately acuminate posteriorly, about $1.2\times$ as long as thorax + propodeum.

Male: Color like female, except all coxae brown and head with brighter color. Length of body: 1 mm. Scape apically expanded, flagellar segments I–III about $2\times$, IV and V about $2.5\times$ as long as wide. Malar space as wide as width of scape in widest part. Ratios HE/MS/MO = $3.4/1.0/2.6$, POL/OOL/POO = $14.0/6.0/1.0$, WH/WT = $1.5/1.0$. Gaster slightly longer than thorax + propodeum. Otherwise as in female.

Type material.—Holotype ♀ labelled: "USA: West Virginia, Greenbrier Co., 10 miles E. Richwood, Summit Lake, 29.vii.1983, leg. L. Huggert," in LUZM. Paratypes: 2 ♀ with same label as holotype; 1 ♀ "USA: West Virginia, Greenbrier Co., Richwood, Summit Lake, 27.vii.1983, leg. L. Huggert"; 2 ♀, 1 ♂ "USA: West Virginia, Pocahontas Co., Falls of Hills Creek, 22.vii.1983, leg. L. Huggert"; 3 ♀ "USA: West Virginia, Pocahontas Co., Falls of Hills Creek, Monongahela Forest, 26.vii.1983, leg. L. Huggert"; 1 ♂ "USA: West Virginia, Pocahontas Co., Dogway Road, Monongahela Forest, 26.vii.1983, leg. L. Huggert"; 1 ♀ "Canada: Quebec, Bouchette, Lac Roddick, 12.ix.1982, leg. L. Huggert." These paratypes deposited: 3 ♀, 1 ♂ in CH, 5 ♀, 1 ♂ in LUZM, 1 ♀ in USNM; 1 ♀ "N.S.C.B.H.N.P., Skyline Trail, 25.vii.1983," "Birch PG 635802, B.R.I. Survey"; 1 ♀ "Prince Edward I., Sand Banks Prov. Pks., 25.vii.1982, L. Masner"; 1 ♀ "St. Lawrence Is. Nat. Park, Ontario, Thwartway Is.," "19.vii.1976, L. Masner, Code 4212-7"; final three paratypes in CNC.

Distribution.—Canada (Nova Scotia, Ontario, Prince Edward Island, Quebec) and the United States (West Virginia).

Holcopelte huggerti, NEW SPECIES

Figs. 6–12

Diagnosis.—Petiole quadrate (♀), or $1.5\text{--}3.0\times$ as long as wide (♂) with a thin dorsal shield that covers petiolar foramen; cubital

hair-line strongly sinuate below speculum; reticulation on thoracic dorsum raised; midlobe of mesoscutum separated from scutellum by a narrow transverse furrow; propodeum with two plicae; ratio width/length of dorsellum = $5.9/1.0$. Female: antennal scrobes never meet; scape $8.0\times$ as long as wide, with 3–5 setae along ventral edge. Male: scape narrowed apically; flagellum pale; flagellar segments $3.5\times$ (apical segment $5.0\times$) as long as wide and slightly narrowed in median part; head about as high as wide in frontal view.

Description.—*Female*: Scape yellowish-white, remaining antenna infusate. Frons and occiput dark brown with a weak golden or golden-green tinge. Thorax dark brown with a golden tinge. Forecoxa brown, mid- and hindcoxae pale (usually white, but occasionally yellowish), remaining parts of fore- and midlegs usually more or less infusate (especially femora), hindleg usually predominantly pale. Wings hyaline with pale veins. Petiole yellowish-white. Gaster with same color as thorax. Length of body: 0.9–1.3 mm. Scape narrow with 3–5 setae along ventral edge. All five flagellar segments free, segment I about $2.8\times$, II, III and V about $3.8\times$, and IV about $3.4\times$ as long as wide. Ratios HE/MS/MO = $4.2/1.0/2.4$. Malar space about $2.5\times$ as wide as width of scape in widest part. Frontal fork V-shaped. Inner orbit of eye with one row of setae. Ratios POL/OOL/POO = $13.0/10.0/1.0$. Entire occipital margin with a fine and sharp edge, extending from eye to eye. Ratio WH/WT = $1.5/1.0$. Pronotal collar without transverse carina. Mesoscutum and scutellum with fine but distinctly raised reticulation, stronger along sides and hind part of scutellum. Meshes elongate in median part of both mesoscutum and scutellum, otherwise isodiametric. Median furrow on thorax weak, extending from posterior $\frac{1}{3}$ of mesoscutum to anterior $\frac{1}{3}$ of scutellum, sometimes absent on mesoscutum. Notaular depressions like *americana*. Midlobe of mesoscutum separated from scutellum by a narrow furrow. Dorsellum short, $5.9\times$ as

wide as long, with surface convex. Shape of wings like *americana*. Speculum present and closed below, eubital hair-line strongly sinuate below speculum. Ratios length of marginal/postmarginal/stigmal veins = 7.4/1.0/1.3. Anterior part of propodeum with a relatively wide transverse furrow, extending between stigmata. Only one pair of plicae present, situated in level with stigmata. Also with a pair of carinae ascending from upper corners of petiolar foramen, reaching about half way up on propodeum. Propodeal surface otherwise smooth. Propodeal callus with two setae. Petiolar foramen quadrate, upper margin rounded. Petiole quadrate, with a thin dorsal shield anteriorly, shield covering petiolar foramen. Gaster ovate, more acuminate than *americana* posteriorly, about 1.3× as long as thorax + propodeum.

Male: Color like female, except entire antenna pale and all coxae infuscate. Length of body: 1.1–1.4 mm. Scape narrowed apically. Flagellar segments I–IV about 3.5×, and V about 5.0× as long as wide. Malar space 1.2× as wide as width of scape in widest part. Ratios HE/MS/MO = 2.9/1.0/2.0, POL/OOL/POO = 15.0/7.2/1.0, WH/WT = 1.3/1.0. Median furrow on thorax extending along entire scutellum in some specimens. Petiole 1.5–3.0× as long as wide. Gaster slightly longer than thorax + propodeum. Otherwise as in female.

Type material.—Holotype ♀ labelled: "USA: West Virginia, Greenbrier Co., 10 miles E. Richwood, Summit Lake, 29.vii.1983, leg. L. Huggert" in LUZM. Paratypes: 2 ♀ with same label as holotype; 1 ♀ "USA: West Virginia, Pocahontas Co., Falls of Hills Creek, Monongahela Forest, 26.vii.1983, leg. L. Huggert"; 1 ♀ "Peru: Huanueu, To-cache, 2.ii.1984, leg. L. Huggert"; 1 ♀ "Peru: Cusco, Machu Pichu, 21.xii.1983, leg. L. Huggert"; 2 ♀ 6 ♂ "Peru: Cusco, Aqua Caliente, 28.xii.1983, leg. L. Huggert"; 1 ♀ "Ecuador: Napo, Lumbaqui, 10–11.iii.1983, leg. L. Huggert"; 1 ♀ "Ecuador: Pichin, Rio Palenque, 4.ii.1983, leg. L. Huggert"; 2 ♀ "Ecuador: Pichin, Puerto Quito, 2.iii.1983, leg.

L. Huggert"; 4 ♀ 2 ♂ in CH, 6 ♀ 3 ♂ in LUZM, 1 ♀ 1 ♂ in USNM.

Distribution.—The United States (West Virginia), Ecuador and Peru.

Genus *Ionympha* Graham

Ionympha Graham, 1959: 199. Type-species: *Entedon ochus* Walker, 1839: 21, by original designation.

Diagnosis.—Mandibles multidentate, long and narrow (Fig. 14); antennal scrobes never meet (Fig. 13); frons below fork with fine reticulation at least in some places; antenna with two small and discoid anelli; male flagellar segments with hairs placed evenly (not only a basal whorl as in *Holcopelte*); notaular depressions shallow and not delimited from remaining mesoscutum; propodeum smooth and shiny without plicae; male gaster with a pale subbasal spot.

Remarks.—The monophyly of *Ionympha* is shown through the following synapomorphies: 1) mandibles long and narrow; 2) male gaster with a pale subbasal spot.

For identification and description of the species see Graham (1959: 199–200). The key in Graham can be supplemented with the following character: female *I. carne* with 2–5 setae on propodeal callus, 7–9 setae in *ochus*.

Ionympha carne (Walker)

Figs. 13–14

Entedon carne Walker, 1839: 123.

Ionympha carne (Walker), Graham, 1959: 200.

Material.—CANADA: 1 ♀ Ontario, Rondeau Prov. Park, 26.viii.1982. ECUADOR: 1 ♀ Pichin, Tinalandia, 800 m, 7.ii.1983. PERU: 1 ♀ Cusco, Ollantaytambo, 19.xii.1983; 1 ♀ Cusco, Machu Pichu, 21.xii.1983. All leg. L. Huggert (1 ♀ in CH, 3 ♀ in LUZM). Type material of *E. carne* in BMNH (not seen).

Remarks.—Most European specimens of this species have dark coxae and remaining parts of legs predominantly infuscate. Three

of the females from the Americas have mid- and hindcoxae and remaining hindleg pale. However, there are some European specimens with hindcoxa pale, and one of the females from Peru has all legs entirely infuscate. The infuscation of the legs frequently shows a high degree of intraspecific variation in many species of Eulophidae and I do not regard this difference in color between European and American specimens as a species character. American specimens of *I. carne* have, on the average, a weaker reticulation on the thoracic dorsum than European specimens. The midlobe of mesoscutum is usually partly, and the scutellum is predominantly, smooth and polished in American specimens. However, in some species of Eulophidae with a Holarctic distribution, e.g. *Chrysocharis prodice* (Walker), American specimens tend to have a weaker reticulation on the thoracic dorsum (Hansson 1987). This tendency becomes even more apparent in specimens from the southern Nearctic region.

Distribution.—West Palearctic (Bouček & Askew 1968), Canada (Ontario), Ecuador and Peru. *Ionympha carne* was previously not recorded from the Americas.

Ionympha ochus (Walker)

Entedon ochus Walker, 1839: 21.

Ionympha ochus (Walker), Graham, 1959: 200.

Material.—CANADA: 1 ♀ British Columbia, N. Vancouver, 31.viii.1960, S. M. Clark (CNC). This specimen agrees well with European specimens. Type material of *I. ochus* in BMNH (not seen).

Distribution.—West Palearctic (Bouček & Askew 1968) and Canada (British Colum-

bia). *Ionympha ochus* was previously not recorded from the Nearctic Region.

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LITERATURE CITED

- Ashmead, W. H. 1894. Report on the parasitic Cynipidae, part of the Braconidae, the Ichneumonidae, the Proctotrypidae, and part of the Chalcididae. Part II. J. Linn. Soc. (Zool.) 25: 108–188.
- . 1904. Classification of the chalcid flies or the superfamily Chalcidoidea, with descriptions of new species in the Carnegie Museum, collected in South America by Herbert H. Smith. Mem. Carneg. Mus. 1(I–IX): 225–551.
- Bouček, Z. 1969. Descriptive and taxonomic notes on ten, mainly new, species of West Palearctic Eulophidae (Hymenoptera). Acta Entomol. Mus. Natl. Pragae 38: 525–543.
- Bouček, Z. and R. R. Askew. 1968. Palearctic Eulophidae (excl. Tetrastichinae). Index of Entomophagous Insects. Le Francois, Paris. 254 pp.
- Erdős, J. 1958. Eulophidae in Hungaria recenter detectae. Acta Zool. Hung. 3: 205–223.
- Förster, A. 1841. Beiträge zur Monographie der Pteromalinen Nees. Aachen. 46 pp.
- . 1856. Hymenopterologische Studien. II. Chalcidiae und Proctotrupii. Aachen. 152 pp.
- . 1861. Ein Tag in den Hochalpen. Progr. Realschule Aachen für 1860/61. 44 pp.
- Graham, M. W. R. de V. 1959. Keys to the British genera and species of Elachertinae, Eulophinae, Entedontinae and Euderinae (Hym., Chalcidoidea). Trans. Soc. Br. Entomol. 13: 169–204.
- Hansson, C. 1987. Revision of the New World species of *Chrysocharis* Förster (Hymenoptera: Eulophidae). Entomol. Scand. Suppl. 31: 1–87.
- Thomson, C. G. 1878. Hymenoptera Scandinaviae. Vol. 5. Lund. 307 pp.
- Walker, F. 1839. Monographia Chalciditum. I. London. 333 pp.